FY 2002 Accomplishments

Hanford Tank Farms

FY 2002

October 2001 -
September 2002

Office of River Protection

CH2MHILL
Hanford Group, Inc.

During fiscal year 2002, CH2M HILL Hanford Group announced a new focus in its work for the Department of Energy's Office of River Protection. Beginning in fiscal year 2003, a new unit of the company will concentrate exclusively on accelerating closure of Hanford's radioactive waste tanks. The announcement reflects discussions and planning during FY 2002 by the Department of Energy, the Washington State Department of Ecology, Hanford stakeholders, and CH2M HILL on how to accelerate tank cleanup and closure.

During the year, important safety milestones were reached, while significant progress was made in the effort to reduce the risk to the nearby Columbia River and prepare for sending tank waste to the nearby vitrification plant—which began construction this year—for treatment.

New partnerships were formed to continue construction upgrades needed to establish a network of piping between tanks and install retrieval equipment in double-shell staging tanks, so that millions of gallons of hazardous and radioactive tank waste can be moved from Hanford's oldest tanks to treatment.

An innovative facility that allows the Office of River Protection and CH2M HILL to test tank cleanup equipment in a simulated environment was built and began operations. The 800,000 gallon simulated waste tank in the facility will be a key player in the effort to accelerate tank cleanup and the site of critical equipment testing and operator training.

Innovations such as the tank crawler promise to provide new opportunities for cleaning up tanks more efficiently. Another innovation, the Pit Viper™, shows the potential of putting employee-generated ideas into action to reduce worker risk and accelerate cleanup.

Innovations, hard work by employees, and a realignment of the company to provide more focus on accelerated tank cleanup and closure have set the stage for a new era of tank cleanup—closure of the first Hanford tank.

Working Safely

Safety Assessment

- The Department of Energy Office of River Protection recently completed an assessment of how CH2M HILL Hanford Group is integrating safety into every project.
- The assessment focused on how CH2M HILL's Integrated Safety Management System plans work, identifies and prevents hazards, performs work, and makes improvements based on lessons learned. The assessment identified 12 strengths and 12 issues for improvement for CH2M HILL.
- Among other things, the assessment concluded:
- There is a positive safety culture in place at the Hanford tank farms.
- CH2M HILL has made major improvements in the ability of employees to identify and track safety concerns.
- New corporate safety policies are implemented by CH2M HILL senior management, which has in turn provided direction to facility managers for implementation in the field.
- A comprehensive process exists to identify and address safety issues and concerns as they arise and the management team is highly aware of safety and safety integration issues.
- The Office of River Protection integrates its safety activities and oversight with CH2M HILL.

Safety Milestone

CH2M HILL employees worked more than two million safe hours. The accomplishment represented approximately eight months without an injury that resulted in time away from work. During that time, work was accomplished on retrieving waste from tanks, building the transfer system needed to move waste to the vitrification plant, and planning for cleaning up and closing the first Hanford tanks. CH2M HILL employees and Department of Energy Office of River Protection Manager Roy Schepens, who applauded the concern for safety being shown by employees, recognized the accomplishment of the first million safe hours at an all-hands celebration, pictured above, in July.

Partnerships

Buying Locally

- CH2M HILL bought 59 percent, or approximately $54 million, of its services and products from local businesses. The $54 million spent includes contract awards, purchase orders, and goods purchases going to businesses in Benton, Franklin, Yakima, and Walla Walla counties.
- Over 64 percent of the total subcontractor dollars went to small businesses during fiscal year 2002.

CH2M HILL bought two-thirds of its services and products from local small business.

Collective Bargaining Agreement Ratified

- Members of the Hanford Atomic Metal Trades Council, an umbrella organization made up of 14 labor union locals representing Hanford workers, approved a new five-year agreement with CH2M HILL. Approximately 525 of the more than 1,400 CH2M HILL Hanford Group employees are represented by HAMTC. The agreement supports the business needs of the company and the interests of represented employees, and it supports the Department of Energy by positioning the workforce to support ongoing nuclear operations and accelerated tank closure initiatives.

Changing a jumper in a valve pit.

Construction Contracts

- Separate contracts were awarded in November 2001 to teams led by Fluor Federal Services and Washington Group International to provide construction services for the tank farms and infrastructure for transferring waste to the waste treatment (vitrification) plant. The contracts have a total estimated value of $107 million over a five-year period and call for the companies to compete for the rights to do specific projects.

Partnerships

CBC Building Naming

- Columbia Basin College renamed its Workforce Training Center the CH2M HILL Technology Education Center in August. College President Lee Thornton said the naming recognizes CH2M HILL's generosity for its $2 million endowment and encourages other businesses to support community colleges. CH2M HILL's economic development efforts are aimed at promoting job growth through technology-based education. The announcement was made at a community reception attended by college officials, community members, Office of River Protection and CH2M HILL Hanford Group managers, and the CH2M HILL corporate board, marking the board's first visit to the Tri-Cities.

Columbia Basin College President Lee Thornton, CH2M HILL Hanford Group President Ed Aromi, and CH2M HILL President Ralph Peterson pose in front of the newly renamed CH2M HILL Technology Education Center.

Meeting Commitments to Protect the River

A record amount of radioactive liquid waste that threatened the Columbia River was moved from older single-shell tanks to newer, safer double-shell tanks, bringing the total amount of waste moved since 1998 to more than 2.5 million gallons.

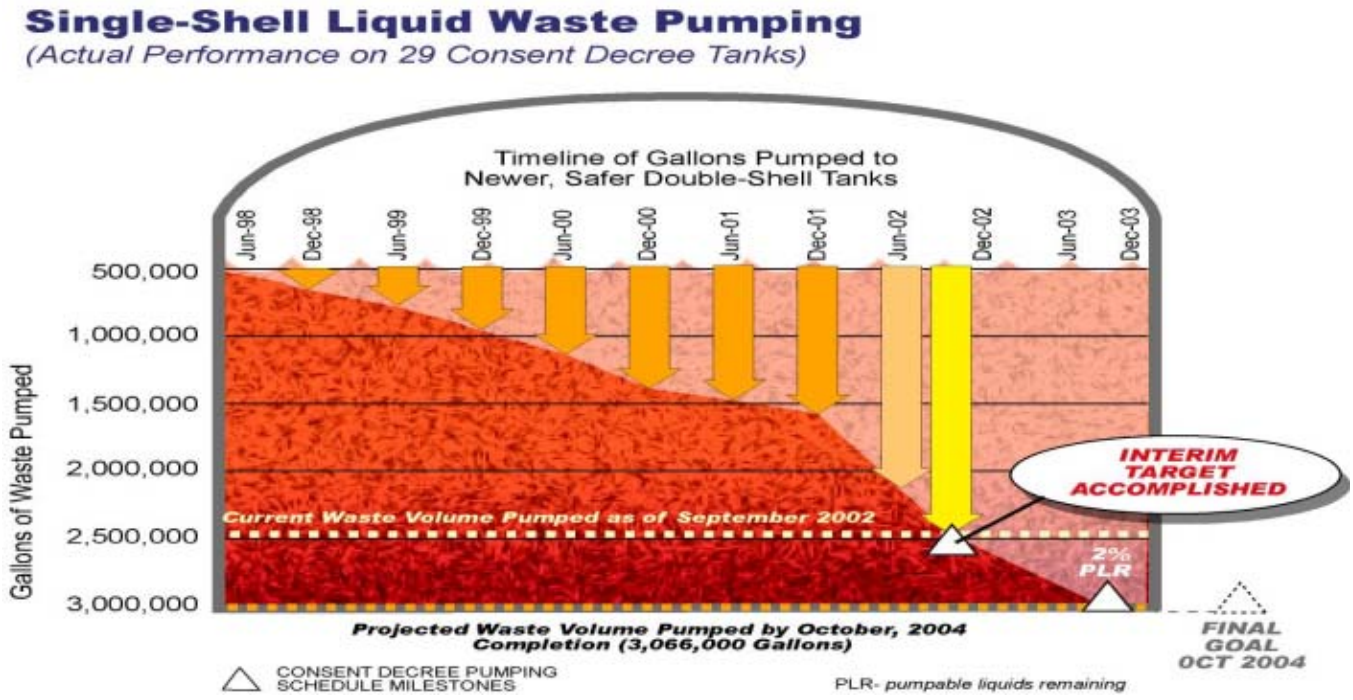
That's when pumping operations began on the last of the 149 single-shell tanks containing removable liquid waste. An aggressive schedule negotiated by the Department of Energy and the state of Washington tracks progress on the project. The schedule called for pumping 2.5 million gallons of waste by September 30. Hanford officials have until October 2004 to remove the remaining 600,000 gallons of liquid waste from the tanks.

Meeting the regulatory milestone is the result of hard work and a concentrated effort by the Office of River Protection and tank farms contractor CH2M HILL Hanford Group. Of the 16 tanks with pumpable liquid left in them, pumping is underway on 15 tanks and pump equipment is being installed in the last tank.

Although solids and sludge will remain in the tanks, transferring the liquid waste to newer, safer double-shell tanks is crucial to reducing the risk of a future leak. In the past, 67 of Hanford's single-shell tanks are assumed to have leaked an estimated one million gallons of radioactive waste.

CH2M HILL and its subcontractors pumped more than one-and-a-quarter million gallons of liquid waste out of the tanks this year. The company set a monthly pumping record in February by removing approximately 300,000 gallons of waste.

"There has been a tremendous effort by the people who work on single-shell tanks to get the job done safely and on time," said CH2M HILL President and General Manager Ed Aromi. "Despite formidable challenges posed by aging equipment, breakdowns, and slower than expected pumping rates, the project team has pumped more waste out of these tanks in the last year than in all of the previous years combined. This sets the stage for removing the remaining waste and further reducing the risk to our employees, the public, and the Columbia River."



Preparations to Retrieve Waste

Hanford Cold Test Facility

- Demonstrations of waste retrieval equipment continue at a testing facility with a simulated to-scale Hanford waste tank. Construction of the $2.4 million facility began in fall 2001 and was completed in May 2002. Operators will use environmentally friendly simulated waste at the Hanford Cold Test Facility to test cleanup equipment prior to use in a real Hanford tank
- The first operations began at the Hanford Cold Test Facility in June with the demonstration of a sprinkler assembly, developed to remove solid waste from Hanford's older single-shell tanks. Preparations are being made for a second major demonstration in fall 2002 of a remote-controlled in-tank vehicle called the Tank Crawler, designed to remove sludge waste from tanks.

Cold Test Facility facts

- The open-top steel tank is the same width as a million-gallon Hanford tank (75 feet wide) and is 27 feet tall with a superstructure (decks) to simulate the top of single-shell tanks (35 feet high) and double-shell tanks (55 feet high)
- The tank holds up to 800,000 gallons of reusable, non-hazardous, and non-radioactive simulated waste

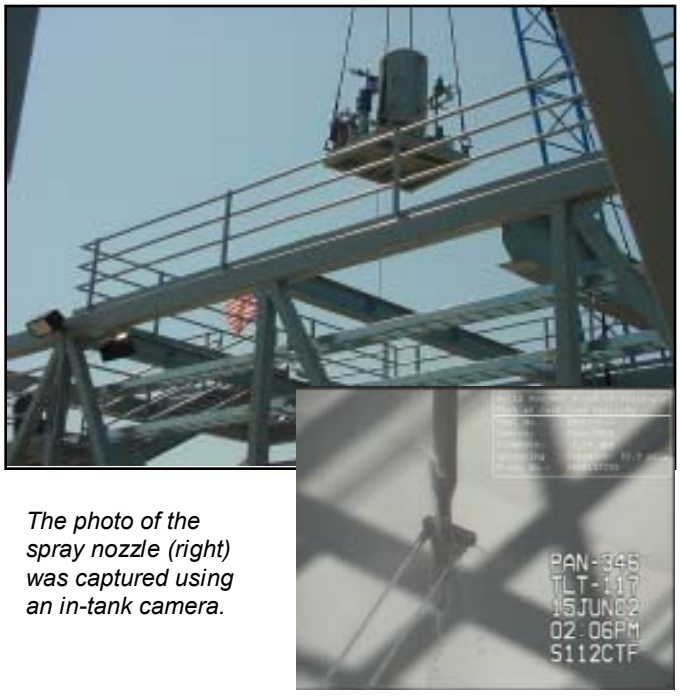
Hanford Cold Test Facility.

Operations

- The Cold Test Facility is managed by tank farms contractor CH2M HILL Hanford Group for the Department of Energy's Office of River Protection. Activities include:
  - Single-shell tank retrieval equipment demonstrations
  - Sludge waste retrieval (mobile robotic crawler)
  - Salt cake waste retrieval
  - Mixed sludge/salt cake waste retrieval
  - Tank waste mixer pumps and transfer pumps
  - Instruments and samplers

Benefits

- Increases confidence when work moves to the field
- Increases worker knowledge and safety
- Reduces probability of issues arising from first testing in a real tank environment
- Reduces costs and improves schedule



The photo of the spray nozzle (right) was captured using an in-tank camera.

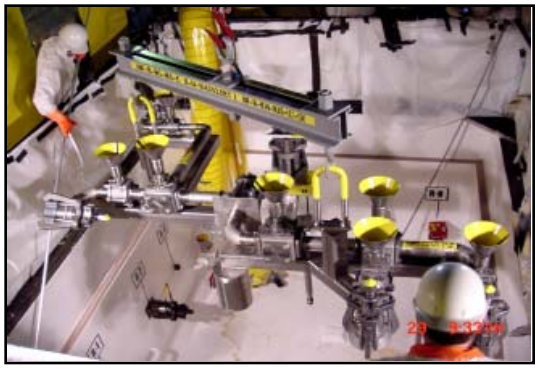
Preparations to Support Vitrification of Tank Waste

Overview

CH2M HILL Hanford Group is managing several projects that will support the Hanford vitrification plant. These include upgrading tank farm instrumentation control, ventilation, waste transfer, and electrical systems; providing tank retrieval systems; upgrading the Hanford Canister Storage Building to allow it to hold in interim storage immobilized high-level waste; and construction of an environmentally compliant landfill for disposal of immobilized low-activity waste. Significant progress has been made to prepare Hanford's tanks for treatment activities.

Waste transfer system: Piping and process pits

- More than 10,000 feet of double-walled waste transfer piping has been installed to enable waste transfers between tanks. Approximately 7,000 more feet of piping is being readied for installation beginning in fall 2002 to connect the tank storage area with the vitrification facility construction site. Thirty-nine waste transfer hubs, called process pits, are being upgraded to enable safe and efficient routing of waste. Six waste transfer pits are complete, and work is near completion on nine others.



Construction activities were performed simultaneously in an unprecedented five tank farms.

Transfer piping is fabricated prior to installation.

Waste transfer system: Staging tanks

- A key part of the effort to treat tank waste is upgrading selected double-shell tanks so they can serve as staging tanks—receiving waste as it is retrieved from the site's older single-shell tanks and storing the waste until it can be sent to the vitrification plant for treatment. In August, crews with Fluor Federal Services started construction on the first of 10 retrieval systems, 23 months ahead of a Tri-Party Agreement milestone.

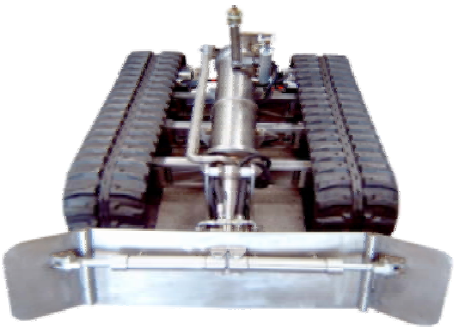
Installed approximately 10,000 feet of waste transfer piping and will install an additional 8,700 feet of piping by 2005.

A newly constructed waste transfer pit.

Tank Crawler

Most of the liquid waste has been moved from Hanford's older tanks to newer, safer double-shell tanks. Methods are being developed to remove the remaining solid waste—more than 31 million gallons by volume. That waste consists of salt cake, which is somewhat like wet beach sand, and sludge that looks like fine mud and dries very hard.

- A tank crawler arrived at Hanford in August to undergo demonstrations prior to cleaning up sludge waste inside a tank. The crawler is a remote-controlled, 1,300 pound in-tank vehicle that is sturdy and agile. It looks like a small bulldozer with treads and a blade. With the push of a button, hydraulics fold the crawler to just two feet wide, narrow enough to enter a tank. Once inside, the crawler will push its way through thick sludge, moving the waste toward a central pump that will transfer out the tank contents.



- In the coming months, the crawler will undergo demonstrations in the large, to-scale simulated waste tank at Hanford's Cold Test Facility with simulated sludge waste. The first test will be conducted with mud, which is similar in particle size and viscosity to sludge tank waste. The crawler is designed to be capable of retrieving sludge waste from up to 60 single-shell tanks.

Tank crawler.

Tank crawler in the simulated tank at the Hanford Cold Test Facility.

Innovations

Pit Viper™

- The Pit Viper™ — a robotic arm attached to a backhoe — was tested for the first time in a process pit at single-shell Tank C-104 in December to determine the range of its capability to do remote cleanup work. The concrete process pits contain waste transfer equipment, including valves, transfer pipe connections, and pumps.
- The Pit Viper™ operator sits at a control console located in a trailer outside the tank-farm fence line and guides the arm, watching multiple views from video monitoring screens. The arm can be equipped with a variety of tools so that tasks in highly radioactive and contaminated environments requiring a great deal of skill and dexterity can be performed remotely, instead of by hand, thus reducing the risk to people.

Pit Viper™.

Polyurea

- A substance similar to a spray-on truck bed liner, called polyurea, is being applied to the walls and floors of process pits as they are upgraded to support future waste transfers to the vitrification plant. Polyurea provides a durable, abrasion-resistant barrier to the environment in these pits, which are often highly radioactive and contaminated. In many cases, application of polyurea reduces the time-consuming process of grinding and grouting fissures in the concrete and applying epoxy to renew secondary containment. The protective coating is also being applied in closure activities at the 244-AR Vault, a facility that served as a lag and treatment facility for Plutonium Uranium Extraction (PUREX) plant waste from the late 1960s to the early 1990s.

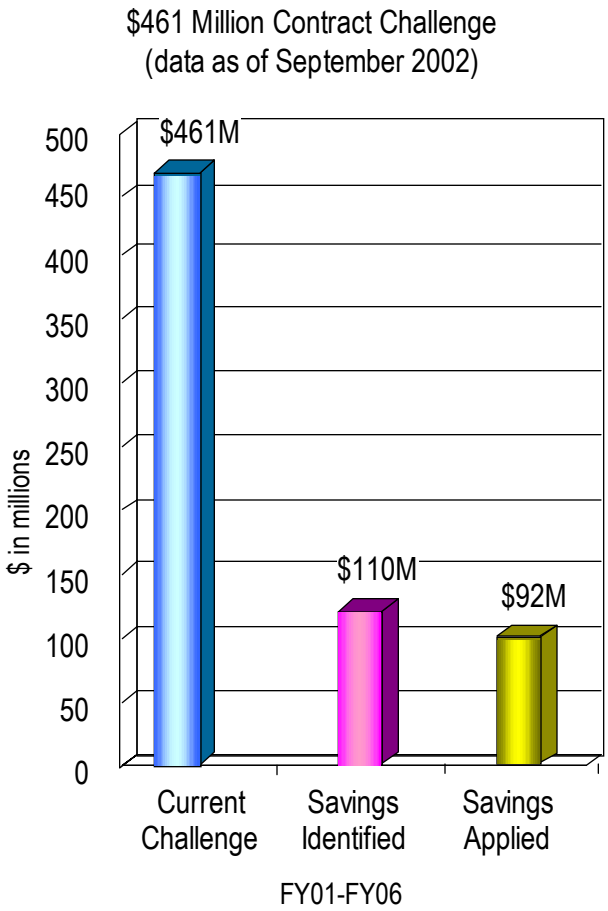
244-AR Vault closure.

Working Efficiently

CH2M HILL Hanford Group Contract

Contract at a glance

- Perform $2.5 billion worth of work for $2.2 billion in funding at contract signing
- Save through efficiencies and eliminate unneeded projects
- Complete ~310 performance based and regulatory milestones through the end of fiscal year 2006 (133 are complete)



Scope of work at a glance:

- Safely store 53 million gallons of radioactive waste in 177 tanks
- Prepare to retrieve and transfer waste for treatment in the vitrification facility
- Prepare to dispose of treated waste products
- Prepare to close tanks

Contract challenge ($461 million)

- Challenge has grown from $300 million to $461 million since contract signing in January 2001 through additional work scope and new requirements

Savings identified ($110 million)

- Save through efficiencies and eliminate unneeded projects

Savings applied ($92 million)

- $92 million in documented savings were applied to work on:
  - Accelerating tank closure demonstrations
  - Accelerating retrieval of solid (salt cake) waste in single-shell tanks
  - Upgrading two double-shell tanks required to transfer and stage waste for treatment in the Vitrification Plant
  - Installing water run-off controls at single shell tank facilities to slow the movement of contaminants from past tank leaks toward the groundwater and the Columbia River
  - Performing ultrasonic examinations of double-shell tank walls and adjusting tank chemistry to prevent corrosion

Award-winning Work

Vitrification Plant Infrastructure Project

- The Waste Treatment Plant Infrastructure Project, managed by CH2M HILL Hanford Group, was honored in March as the winning project in the regional Project of the Year competition sponsored by the Columbia River Basin Chapter of the Project Management Institute.
- In 2001, CH2M HILL and its subcontractors completed roads and electrical and other utilities for the vitrification plant a year early and $9 million under budget. The project will advance to the second level of the Institute's three-tier competition.

Waste Treatment (vitrification) Plant infrastructure project.

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September 2002

A prime contractor for the
U.S. Department of Energy
Office of River Protection